

## WHAT IS CLAIMED IS:

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1. A method for predicting value of non-underwritten assets for which data representations are partial or incomplete by projecting values onto the non-underwritten assets from at least one of fully underwritten assets, other non-underwritten assets with complete data representations and available data from non-underwritten assets with partial or incomplete data representations having similar identifiable characteristics, said method comprising the steps of:

sampling assets according to risk;

underwriting assets and recording valuations;

forming market value clusters;

building regression models for underwritten assets;

selecting the best models for the underwritten assets;

counting a number of times the models are selected; and

using the selected model to make a prediction of underwriting value for the non-underwritten assets.

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2. A method according to Claim 1 wherein said step of sampling assets according to risk further comprises the step of selecting assets from a list ordered by at least one of decreasing unpaid principal balance and previous appraisal amount.

20 3. A method according to Claim 1 wherein said step of underwriting assets and recording valuations further comprises the step of storing valuations in a master database, the valuations summarized in terms of monetary units at current market prices.

4. A method according to Claim 1 wherein said step of forming market value clusters further comprises the step of performing a classification and

regression tree analysis using previous appraisal amount as a driving variable, resulting in a grouping of assets according to collateral usage and market value groups.

5. A method according to Claim 1 wherein said step of building regression models for underwritten assets further comprises the step of building models which use as variables different groupings of data representations.

6. A method according to Claim 5 wherein said step of selecting the best models for the underwritten assets further comprises the step of selecting models according to  $\min_k \{abs(y - \hat{y}_k), 1E^{99}\}$ , where  $y$  is the underwriting value to be predicted, and  $\hat{y}_k$  is a prediction from the  $k^{th}$  regression model, for  $k = 1, 2, \dots, K$ , where  $K$  is a number of models built.

7. A method according to Claim 1 wherein said step of counting a number of times the models are selected further comprises the step of counting a number of times each model produced a best prediction for underwriting of assets.

8. A method according to Claim 1 wherein said step of using the selected model to make a prediction of underwriting value for the non-underwritten assets further comprises the step of predicting underwriting value according to

$$\hat{y}_l = \frac{\sum_{i,j,k} I_{lk} f_{ijk} \hat{y}_{lk}}{\sum_{i,j,k} I_{lk} f_{ijk}}$$

where  $I_{lk} = 1$  if model  $k$  produced a prediction for asset  $l$ , and is zero otherwise;  $f_{ijk}$  = count of times model  $k$  was selected for UW assets among the  $i^{th}$  collateral usage and market value group type ( $i = 1, 2$ ), and the  $j^{th}$  collateral usage and market value group cluster ( $j = 1, 2, 3$ ); and  $\hat{y}_{lk}$  = prediction for  $y_l$  from model  $k$ .

9. A method according to Claim 8 further comprising the step of estimating at least one of a lower confidence limit and an upper confidence limit for the predicted underwriting value.

10. A method according to Claim 9 wherein said step of estimating at least one of a lower confidence limit and an upper confidence limit further comprises the step of substituting a corresponding statistic for  $\hat{y}_{lk}$ .

11. A system for predicting value of non-underwritten assets for which data representations are partial or incomplete by projecting values onto the non-underwritten assets from at least one of fully underwritten assets, other non-underwritten assets with complete data representations and available data from non-underwritten assets with partial or incomplete data representations having similar identifiable characteristics, said system comprising:

a computer configured as a server and further configured with a database of asset portfolios;

at least one client system connected to said server through a network, said server configured to sample assets according to risk, underwrite assets and record valuations, form market value clusters, build regression models for underwritten assets, select the best models for the underwritten assets, count a number of times the models are selected and use the selected model to make a prediction of underwriting value for the non-underwritten assets.

12. A system according to Claim 11 wherein said server configured to select assets from a list ordered by at least one of decreasing unpaid principal balance and previous appraisal amount.

13. A system according to Claim 11 wherein said server configured to store valuations in a master database, the valuations summarized in terms of monetary units at current market prices.

14. A system according to Claim 11 wherein said server configured to perform a classification and regression tree analysis using a previous appraisal amount as a driving variable, resulting in a grouping of assets according to collateral usage and market value groups.

15. A system according to Claim 11 wherein said server configured to build models which use as variables different groupings of data representations.

16. A system according to Claim 15 wherein said server configured to select models according to  $\min_k \{abs(y - \hat{y}_k), 1E^{99}\}$ , where  $y$  is the underwriting value to be predicted, and  $\hat{y}_k$  is a prediction from the  $k^{th}$  regression model, for  $k = 1, 2, \dots, K$ , where  $K$  is a number of models built.

17. A system according to Claim 11 wherein said server configured to count a number of times each model produced a best prediction for underwriting of assets.

18. A system according to Claim 11 wherein said server configured to predict underwriting value according to

$$\hat{y}_l = \frac{\sum_{i,j,k} I_{lk} f_{ijk} \hat{y}_{lk}}{\sum_{i,j,k} I_{lk} f_{ijk}},$$

where  $I_{lk} = 1$  if model  $k$  produced a prediction for asset  $l$ , and is zero otherwise;  $f_{ijk}$  = count of times model  $k$  was selected for UW assets among the  $i^{th}$  collateral usage and market value group type ( $i = 1, 2$ ), and the  $j^{th}$  collateral usage and market value group cluster ( $j = 1, 2, 3$ ); and  $\hat{y}_{lk}$  = prediction for  $y_l$  from model  $k$ .

19. A system according to Claim 18 wherein said server configured to estimate at least one of a lower confidence limit and an upper confidence limit for the predicted underwriting value.

20. A system according to Claim 19 wherein said server configured to substitute a corresponding statistic for  $\hat{y}_{lk}$ .

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 21. A computer configured to predict value of non-underwritten assets for which data representations are partial or incomplete by projecting values onto the non-underwritten assets from at least one of fully underwritten assets, other non-underwritten assets with complete data representations and available data from non-underwritten assets with partial or incomplete data representations having similar identifiable characteristics, said computer including a database of asset portfolios, said computer programmed to:

10 sample assets according to risk;

underwrite assets and record valuations;

form market value clusters;

build regression models for underwritten assets;

15 select the best models for the underwritten assets;

count a number of times the models are selected; and

use the selected model to make a prediction of underwriting value for the non-underwritten assets.

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 22. A computer according to Claim 21 programmed to select assets from a list ordered by at least one of decreasing unpaid principal balance and previous appraisal amount.

23. A computer according to Claim 21 programmed to store valuations in a master database, the valuations summarized in terms of monetary units at current market prices.

24. A computer according to Claim 21 programmed to perform a classification and regression tree analysis using a previous appraisal amount as a driving variable, resulting in a grouping of assets according to collateral usage and market value groups.

25. A computer according to Claim 21 programmed to build models which use as variables different groupings of data representations.

26. A computer according to Claim 25 programmed to select models according to  $\min_k \{abs(y - \hat{y}_k), 1E^{99}\}$ , where  $y$  is the underwriting value to be predicted, and  $\hat{y}_k$  is a prediction from the  $k^{th}$  regression model, for  $k = 1, 2, \dots, K$ , where  $K$  is a number of models built.

27. A computer according to Claim 21 programmed to count a number of times each model produced a best prediction for underwriting of assets.

28. A computer according to Claim 21 programmed to predict underwriting value according to

$$\hat{y}_l = \frac{\sum_{i,j,k} I_{lk} f_{ijk} \hat{y}_{lk}}{\sum_{i,j,k} I_{lk} f_{ijk}},$$

where  $I_{lk} = 1$  if model  $k$  produced a prediction for asset  $l$ , and is zero otherwise;  $f_{ijk}$  = count of times model  $k$  was selected for UW assets among the  $i^{th}$  collateral usage and market value group type ( $i = 1, 2$ ), and the  $j^{th}$  collateral usage and market value group cluster ( $j = 1, 2, 3$ ); and  $\hat{y}_{lk}$  = prediction for  $y_l$  from model  $k$ .

29. A computer according to Claim 28 programmed to estimate at least one of a lower confidence limit and an upper confidence limit for the predicted underwriting value.

30. A computer according to Claim 29 programmed to substitute a corresponding statistic for  $\hat{y}_{lk}$ .

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